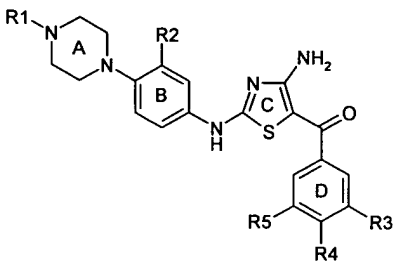


CLAIMS

What is Claimed is:

1. A compound of formula:



or the pharmaceutically acceptable salts or esters thereof, wherein

R¹ is selected from the group consisting of

H,

lower alkyl that optionally may be substituted with a group selected from OR⁶, cycloalkyl, and NR⁷R⁸,

cycloalkyl,

COR⁹, and

SO₂R¹⁰;

R² is selected from the group consisting of

H,

F,

Cl, and

CH₃;

R^5 is selected from the group consisting of

H,

lower alkyl, which optionally may be substituted with a group selected from OR^6 and NR^7R^8 ,

OR^{11} ,

$NR^{12}R^{13}$,

halogen,

NO_2 ,

$CONR^6R^9$,

$NHSO_2R^{14}$,

CN

S-lower alkyl,

OCF_3 , and

$OCHF_2$,

R^3 and R^4 taken together with the two carbons and the bond between them from the benzene ring (D) to which R^3 and R^4 are attached form a ring system having up to two additional rings, each of said rings having 5-7 atoms, and the ring attached to the benzene ring (D) optionally including one or more hetero atoms and being optionally substituted by lower alkyl,

R^6 and R^9 are independently selected from the group consisting of

H, and

lower alkyl that optionally may be substituted by OH and halogen;

R^7 and R^8 are independently selected from the group consisting of

H, and

lower alkyl that optionally may be substituted by OR^6 ,

or, alternatively, R^7 is H and R^8 is OH,

or, alternatively, NR^7R^8 can optionally form a ring having 5-6 atoms, said ring optionally including one or more additional hetero atoms and being optionally substituted by the group consisting of one or more of OR^6 and lower alkyl which itself may be optionally substituted by OH;

R^{10} is selected from the group consisting of

lower alkyl which optionally may be substituted by one or more chlorine or fluorine, and

NH_2 ;

R^{11} is selected from the group consisting of

H, and

lower alkyl that optionally may be substituted by OR^6 , COOH, halogen and $\text{NR}^{15}\text{R}^{16}$;

R^{12} and R^{13} are independently selected from the group consisting of

H,

lower alkyl that optionally may be substituted with a group selected from OR^6 , COOH and $\text{NR}^{15}\text{R}^{16}$,

COR^{17} , and

SO_2R^{18} ,

provided that only one of R^{12} and R^{13} is COR^{17} or SO_2R^{18} ,

or alternatively $\text{NR}^{12}\text{R}^{13}$ can optionally form a ring having 5-6 atoms, said ring optionally including one or more additional hetero atoms and being optionally substituted by the group consisting of one or more of OR^6 and lower alkyl which itself may be optionally substituted by OH;

R^{14} is lower alkyl;

R^{15} and R^{16} are independently selected from the group consisting of

H, and

lower alkyl that optionally may be substituted by OH,

or alternatively $\text{NR}^{15}\text{R}^{16}$ can optionally form a ring having 5-6 atoms, said ring optionally including one or more additional hetero atoms and being optionally substituted by the group consisting of one or more of OR^6 and lower alkyl which itself may be optionally substituted by OH;

R^{17} is selected from the group consisting of

H, and

lower alkyl which optionally may be substituted with a group selected from OH, COOH and $\text{NR}^{15}\text{R}^{16}$; and

R^{18} is lower alkyl.

2. The compound of claim 1 wherein R^1 is selected from the group consisting of H, $\text{CH}_2\text{CH}_2\text{OH}$, $\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$, $\text{CH}_3\text{CO}-$, $\text{CH}(\text{CH}_3)_2$, $\text{CH}_2\text{CH}(\text{CH}_3)_2$, cyclopropylmethyl and CH_3 .

3. The compound of claim 2 wherein R^1 is selected from the group consisting of H, methyl, $\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$ and $\text{CH}(\text{CH}_3)_2$.

4. The compound of claim 1 wherein R^2 is selected from the group consisting of H and fluorine.

5. The compound of claim 4 wherein R^2 is H.

6. The compound of claim 2 wherein R^2 is selected from the group consisting of H and fluorine.

7. The compound of claim 3 wherein R^2 is H.

8. The compound of claim 1 wherein R^3 and R^4 taken together with the benzene ring to which they are attached form a polycyclic ring system.

9. The compound of claim 8 wherein the ring system is selected from the group consisting of 2-dibenzofuranyl, 1,3-benzodioxol-5-yl, 2,3-dihydro-1,4-benzodioxin-6-yl, and 3,4-dihydro-2H-1,5-benzodioxepin-7-yl.

10. The compound of claim 6 wherein R^3 and R^4 taken together with the benzene ring to which they are attached form a polycyclic ring system.

11. The compound of claim 7 wherein R^3 and R^4 taken together with the benzene ring to which they are attached form a polycyclic ring system.

12. The compound of claim 10 wherein the ring system selected from the group consisting of 2-dibenzofuranyl, 1,3-benzodioxol-5-yl, 2,3-dihydro-1,4-benzodioxin-6-yl, or 3,4-dihydro-2H-1,5-benzodioxepin-7-yl.

13. The compound of claim 11 wherein the ring system selected from the group consisting of 2-dibenzofuranyl, 1,3-benzodioxol-5-yl, 2,3-dihydro-1,4-benzodioxin-6-yl, or 3,4-dihydro-2H-1,5-benzodioxepin-7-yl.

14. The compound of claim 8 which is selected from the group consisting of:

[4-Amino-2-[[4-(4-methyl-1-piperazinyl)phenyl]amino]-5-thiazolyl](2,3-dihydro-1,4-benzodioxin-6-yl)methanone,

[4-Amino-2-[[4-(4-methyl-1-piperazinyl)phenyl]amino]-5-thiazolyl](1,3-benzodioxol-5-yl)methanone,

[4-Amino-2-[[4-(4-methyl-1-piperazinyl)phenyl]amino]-5-thiazolyl](3,4-dihydro-2H-1,5-benzodioxepin-7-yl)methanone,

[4-Amino-2-[[4-(4-methyl-1-piperazinyl)phenyl]amino]-5-thiazolyl](2-dibenzofuranyl)methanone,

[4-Amino-2-[[3-fluoro-4-(4-methyl-1-piperazinyl)phenyl]amino]-5-thiazolyl](1,3-benzodioxol-5-yl)methanone,

[4-Amino-2-[[4-[4-(1-methylethyl)-1-piperazinyl]phenyl]amino]-5-thiazolyl](2,3-dihydro-1,4-benzodioxin-6-yl)methanone,

[4-Amino-2-[[4-[4-(1-methylethyl)-1-piperazinyl]phenyl]amino]-5-thiazolyl](1,3-benzodioxol-5-yl)methanone,

1-Acetyl-4-[4-[[4-amino-5-[(1,3-benzodioxol-5-yl)carbonyl]-2-thiazolyl]amino]phenyl]piperazine, and

[4-Amino-2-[[4-[4-(2-hydroxyethyl)-1-piperazinyl]phenyl]amino]-5-thiazolyl](2,3-dihydro-1,4-benzodioxin-6-yl)methanone.

15. The compound of claim 8 which is selected from the group consisting of:

[4-Amino-2-[[3-fluoro-4-(4-methyl-1-piperazinyl)phenyl]amino]-5-thiazolyl](2,3-dihydro-1,4-benzodioxin-5-yl)methanone,

(4-Amino-2-{4-[4-(2-methoxy-ethyl)-piperazin-1-yl]-phenylamino}-thiazol-5-yl)-benzo[1,3]dioxol-5-yl-methanone,

4-Amino-2-{4-[4-(2-methoxy-ethyl)-piperazin-1-yl]-phenylamino}-thiazol-5-yl)-(2,3-dihydro-benzo[1,4]dioxin-6-yl)-methanone,

{4-Amino-2-[4-(4-sec-butyl-piperazin-1-yl)-phenylamino]-thiazol-5-yl}-benzo[1,3]dioxol-5-yl-methanone,

{4-Amino-2-[4-(4-sec-butyl-piperazin-1-yl)-phenylamino]-thiazol-5-yl}-(2,3-dihydro-benzo[1,4]dioxin-6-yl)-methanone,

{4-Amino-2-[4-(4-cyclopentyl-piperazin-1-yl)-phenylamino]-thiazol-5-yl}-benzo[1,3]dioxol-5-yl-methanone,

{4-Amino-2-[4-(4-cyclopentyl-piperazin-1-yl)-phenylamino]-thiazol-5-yl}-(2,3-dihydro-benzo[1,4]dioxin-6-yl)-methanone,

{4-Amino-2-[4-(4-cyclopropylmethyl-piperazin-1-yl)-phenylamino]-thiazol-5-yl}-benzo[1,3]dioxol-5-yl-methanone, and

{4-Amino-2-[4-(4-cyclopropylmethyl-piperazin-1-yl)-phenylamino]-thiazol-5-yl}-(2,3-dihydro-benzo[1,4]dioxin-6-yl)-methanone.

16. The compound of claim 1 wherein R⁵ is selected from the group consisting of H and F.

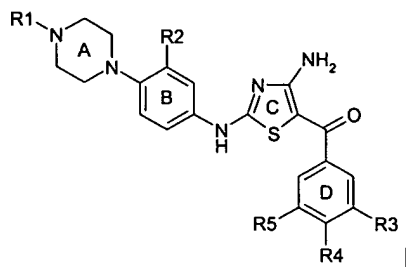
17. The compound of claim 16 wherein R⁵ is F.

18. The compound of claim 10 wherein R⁵ is F.

19. The compound of claim 13 wherein R⁵ is F.

20. The compound of claim 16 wherein R⁵ is H.

21. A compound of formula:



or the pharmaceutically acceptable salts or esters thereof, wherein

R¹ is selected from the group consisting of

H, and

lower alkyl that optionally may be substituted by OR⁶;

R² is selected from the group consisting of H and F;

R³ and R⁴ taken together with the two carbons and the bond between them from the benzene ring (D) to which R³ and R⁴ are attached form a ring system having up to two additional rings, each of said rings having 5-7 atoms, and the ring attached to the benzene ring (D) optionally including one or more hetero atoms and being optionally substituted by lower alkyl,

R⁵ is selected from the group consisting of

H,

OR¹¹, and

F;

R⁶ is selected from the group consisting of

H, and

methyl;

R¹¹ is selected from the group consisting of

H, and

lower alkyl that optionally may be substituted by a group selected from OR⁶, COOH, halogen and NR¹⁵R¹⁶;

R¹² and R¹³ are independently selected from the group consisting of

H,

lower alkyl that optionally may be substituted with a group selected from OR⁶, COOH and NR¹⁵R¹⁶,

or alternatively NR¹²R¹³ can optionally form a ring having 5-6 atoms, said ring optionally including one or more additional hetero atoms and being optionally substituted by the group consisting of one or more of OR⁶ and lower alkyl which itself may be optionally substituted by OH; and

R¹⁵ and R¹⁶ are independently selected from the group consisting of


H, and

lower alkyl that optionally may be substituted by OH,

or alternatively NR¹⁵R¹⁶ can optionally form a ring having 5-6 atoms, said ring optionally including one or more additional hetero atoms and being optionally substituted by the group consisting of one or more of OR⁶ and lower alkyl which itself may be optionally substituted by OH.

22. A pharmaceutical composition comprising as an active ingredient an effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier or excipient.

23. The pharmaceutical composition of claim 22 which is suitable for parenteral administration.



24. A method of treating breast, colon, lung or prostate cancer comprising administering to a patient in need of therapy a therapeutically effective amount of a compound according to claim 1.